

## City of Anaheim Public Utilities Department

### *Model for Small and Midsize Utility Districts around the United States*

#### Abstract

The City of Anaheim Public Utilities Departments (City of Anaheim) smart grid project involves a citywide deployment of advanced metering infrastructure (AMI) and an expansion of distribution automation capabilities, which include circuit switches, remote fault indicators, and smart relays. Commercial customers can enroll in a program to receive programmable communicating thermostats that assist in managing electricity use and costs. These activities allow the City of Anaheim to manage, measure, and verify targeted demand reductions during peak periods. The new AMI and distribution automation technologies help improve service quality and reliability by enabling improved outage management, distribution circuit monitoring, and automated circuit switching.

#### Smart Grid Features

**Communications infrastructure** consists of a new wireless multi-point network from each smart meter to the utility operations center. This infrastructure provides communication capabilities to better understand and integrate customer information, energy delivery system operations, and system reliability information.

**Advanced metering infrastructure** includes the deployment of about 20,000 smart meters throughout the City of Anaheim as well as supporting data management and information technology infrastructure. This system provides automated meter reading, improved meter accuracy, enhanced outage detection, power quality monitoring, and improved meter tampering detection. A new meter data management system provides expanded capabilities to analyze, interpret, and query meter readings and power usage information, which improves the City of Anaheim's billing and electricity management efforts and load forecasting abilities.

**Advanced electricity service options** offered through the project include the ability for commercial customers to receive one of 1,000 programmable communicating thermostats. These devices provide customers with better control of heating and air conditioning and enable more effective participation in demand response programs. Combined with the deployment of smart meters, new grid communication systems (including a supervisory control and data acquisition system (SCADA) and a demand response coordination system, customers have greater ability to reduce or shift electricity use during peak periods.

#### At-A-Glance

**Recipient:** City of Anaheim Public Utilities Department

**State:** California

**NERC Region:** Western Electricity Coordinating Council

**Total Budget:** \$12,167,050

**Federal Share:** \$5,896,025

**Project Type:** Advanced Metering Infrastructure  
Electric Distribution Systems

#### Equipment

- 20,000 Smart Meters
- AMI Communication System
  - Meter Communications Network
  - Backhaul Communications
- 1,000 Programmable Communicating Thermostats
- Distribution System Automation/Upgrade for 11 of 120 Distribution Circuits
  - SCADA Communications Network
  - Automated Distribution Circuit Switches
  - Automated Capacitors
  - Equipment Condition Monitors

#### Key Targeted Benefits

- Reduced Meter Reading Costs
- Reduced Operating and Maintenance Costs
- Increased Electricity Service Reliability and Power Quality
- Deferred Investment in Distribution Capacity Expansion
- Reduced Costs from Equipment Failures and Distribution Line losses
- Reduced Ancillary Service Costs

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**Distribution automation systems** include automated switches, circuit monitors, and capacitor bank controllers with the distribution management system on 11 distribution circuits. This reduces the frequency and duration of service interruptions while also reducing field operations requirements. System reliability and power quality are targeted benefits of this upgrade. Distribution automation also supports future implementation of distributed energy resources such as solar, wind, and combined heat and power systems through automating adjustments to rapid, small fluctuations in grid voltage and current.

**Distribution system energy efficiency improvements** involve the integration of automated capacitors with a power quality monitoring system. The capacitors improve voltage and volt ampere reactive (VAR) control, power quality, and distribution capacity by reducing energy losses on the distribution system.

**Timeline**

Key Milestones	Target Dates
AMI deployment completed	Q2 2014
Distribution automation completed	Q2 2013
Customer systems deployment completed	Q2 2013

**Contact Information**

John Pellegrino  
Principal Electrical Engineer  
City of Anaheim Public Utilities Department  
JPellegrino@anaheim.net